IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN THE APPLICATION OF:

JOSEPH JAMES KEENAN et al.

CASE NO.: BA9309USPCT APPLICATION NO.: 10/524,807

CONFIRMATION NO.: 1657 GROUP ART UNIT: 1616

EXAMINER: DANIELLE D. SULLIVAN FILED: SEPTEMBER 09, 2003

FOR: PROCESS FOR PREPARING PASTE-EXTRUDED SULFONAMIDE COMPOSITIONS

DECLARATION UNDER 37 C.F.R. § 1.132
Luann M. Pugh

I, Luann M. Pugh declare as follows.

1. I received a BS degree in chemistry from the University of Pittsburgh in 1980 and a Ph.D. in Physical Organic Chemistry from the University of Pittsburgh in 1984.

2. I am an employee of E. I. du Pont de Nemours and Company (hereinafter "DuPont"). I am employed as a Senior Research Associate for the Crop Protection business of DuPont, which is located in Wilmington, Delaware, USA.

3. I joined DuPont in 1984. Since that time, I have held assignments in research and manufacturing support. I have held technical positions in Chemicals and Pigments, and Crop Protection. For the past 22 years I have worked as a Formulation Chemist in the Research and Development organization in Crop Protection. Over the past 25 years I have obtained 3 patents.

4. I am providing the following opinions regarding Sandell U.S. Patent 5,474,971, which has been cited during the present examination of U.S. Patent Application 10/524,807. My time spent in the preparation of this Declaration was paid for by DuPont. The opinions expressed herein are my own.

5. I am familiar with the technical area of heat extrusion for preparation of agricultural compositions as described in Sandell United States Patent 5,474,971. I am

providing the following statement regarding the expected effect of adding water to the Sandell heat extrusion process.

6. The following statement was prepared to the best of my knowledge and experience in the field relevant to the subject matter.

STATEMENT

U.S. Patent 4,474,971 (col. 4, lines 25–45) to Sandell specifies a process which includes extruding a dry premix comprising by weight based on the total weight of the composition:

(1) 0.01–90% of one or more active ingredients,

(2) 1–60% of one or more water-soluble diluents,

(3) 0–30% of one or more water-soluble heat activated binders that melt at temperatures between 40 and 120 °C, and

(4) two or more additives selected from a group consisting of (a) 0–10% anticaking agents, (b) 0–10% chemical stabilizers, (c) 0–20% gas generating agents, (d) 0.1–10% wicking or swelling disintegrants, (e) 0.1–20% dispersants, (f) 0–5% wetting agents, and (g) 0–80% inert fillers;

through a die or screen at a temperature from 50 to 130 °C and chopping or milling the extruded material to form uniform granules. (see Col. 1, line 56 through Col. 2, line 12)

Col. 5, lines 2–5 further discloses that generally the extruded material is allowed to cool to harden and reduce stickiness, although a cooling step may not be necessary, before chopping, milling or rolling, and then screening to approximately 10 to 60 U.S. mesh size granules. The Abstract notes the absence of need for drying as a benefit of the Sandell process.

I have considered the expected effect on the Sandell process of disregarding the requirement that premix for extrusion be *dry*, and instead moistening the premix with enough water to change the texture of the premix,

The premix for the Sandell heat-extrusion process comprises four component groups of ingredients. Component (1) is an active ingredient. Component (4) includes at least two additives which are used in the art of formulation. Components (1) and (4) may or may not be water soluble.

Components (2) and (3) share the same physical properties which are relevant to the functioning of the heat-extrusion process of Sandell. First, they both melt or soften at elevated temperatures, and second, they are both water soluble. Component (2) is defined on Col. 13, lines 14–17 as a water-soluble polymer, salt, surfactant, hydrated organic or inorganic compound or carbohydrate which melts or softens at elevated temperatures and acts as the primary extrusion aid. Component (3), the heat-activated

binder, is optional, as it can be present in the premix at 0%. However, Col. 13, lines 36–38 discloses inclusion of a heat-activated binder in addition to the water-soluble diluent as a preferred embodiment. Col. 13, lines 38–47 defines the heat-activated binder as solid, surface active material which dissolves rapidly in water, has some viscosity near its melting point, and is capable of acting as binder and extrusion aid when heat is applied. At an elevated temperature the binder softens and melts, thereby becoming sticky enough to bind the pesticidal particles into aggregates. The softened or melted heat-activated binder is theorized to function as a plastic or viscoelastic lubricant allowing the composition to more easily extrude through a die or screen.

In the Sandell process, on exposure to heat in the extruder, the solid Components (2) and (3) soften or melt, thereby allowing Component (2) to function as the primary extrusion aid and Component (3), when present, as a plasticizer or lubricant, further enabling extrusion of the premix mixture. After removal from heat in the extruder, Components (2) and (3) harden or solidify, which renders the extrudate in condition suitable for breaking into 10 to 60 mesh granules by chopping, milling or rolling.

The result expected from adding water to the premix of Sandell would be a dissolution or partial dissolution of the water soluble Components (2) and (3) which would prevent the softening/melting and the subsequent hardening function of Components (2) and (3) in the premix. The properties of a substance which softens or melts and then subsequently hardens or solidifies require the substance to be in a bulk, or solid, rather than a dissolved phase. Sandell repeatedly states that both Component (2) and Component (3) are water-soluble. Adding water to the premix would therefore disrupt the function of these components.

Because water can act as a plasticizer and lubricant for extrusion, moistening the premix of Sandell would likely not prevent its extrusion. However, converting solid Component (2) and optional solid Component (3) to solution would disrupt the hardening or solidifying of these components after extrusion. The extrudate formed would likely not be suitable for the Sandell process step involving chopping, milling or rolling into granules useful for agricultural compositions. Therefore a formulation chemist desiring to use the Sandell process and achieve the benefits described would not disregard the requirement of a dry premix. Such chemist would not add water to this premix as he/she would understand that this would disrupt the solidifying process and not result in the intended end product, that is, hardened granules useful for agricultural compositions.

I declare under penalty of perjury that the above facts are true to the best of my knowledge.

Signed this 13 day of August, 2010,

Luann M. Pugh

Sworn to and subscribed before me this 13th day of August, 2010,

Signature: Miriam T. Reed

Printed Name: Miriam T. Reed

My Commission Expires: Oct 17, 2011 (Notary Seal)

MIRIAM T. REED
NOTARY PUBLIC
STATE OF DELAWARE
My Commission Expires October 17, 2011